Release Notes for Router Software Version 11.02

Router Software Version 11.02
Site Manager Software Version 5.02

Part No. 114093 Rev. C
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Bay Networks

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USA Requirements Only

Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

This equipment generates, uses, and can radiate radio-frequency energy. If you do not install and use this equipment according to the instruction manual, this product may interfere with radio communications. This product has been tested and found to comply with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Operating this equipment in a residential area is likely to interfere with radio communications; in which case, the user, at his/her own expense, must correct the interference.

Shielded-compliant cables must be used with this unit to ensure compliance with the Class A limits.

EN 55 022 Declaration of Conformance

This is to certify that the Bay Networks products in this book are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022:1987 Class A (CISPR 22:1985/BS 6527:1988).

EN 55 022 Declaration of Conformance

This is to certify that the Bay Networks products in this book are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022:1987 Class B (CISPR 22:1985/BS 6527:1988).

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Voluntary Control Council for Interference (VCCI) Statement

This equipment is in the 1st category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines that are aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when this equipment is used in a residential area or in an adjacent area thereto, radio interference may be caused to equipment such as radios and TV receivers.

Compliance with the applicable regulations is dependent upon the use of shielded cables. The user is responsible for procuring the appropriate cables. Read instructions for correct handling.

Canada Requirements Only

Canada CS-03 Rules and Regulations

Note: The Canadian Department of Communications label identifies certified equipment. The certification means that the equipment meets certain telecommunications network protective operations and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent the degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Canada CS-03 — Règles et règlements

Note: L’étiquette du ministère des Communications du Canada indique que l’appareillage est certifié, c’est-à-dire qu’il respecte certaines exigences de sécurité et de fonctionnement visant les réseaux de télécommunications. Le ministère ne garantit pas que l’appareillage fonctionnera à la satisfaction de l’utilisateur.

Avant d’installer l’appareillage, s’assurer qu’il peut être branché aux installations du service de télécommunications local. L’appareillage doit aussi être raccordé selon des méthodes acceptées. Dans certains cas, le câblage interne du service de télécommunications utilisé pour une ligne individuelle peut être allongé au moyen d’un connecteur certifié (prolongateur téléphonique). Le client doit toutefois prendre note qu’une telle installation n’assure pas un service parfait en tout temps.

Les réparations de l’appareillage certifié devraient être confiées à un service d’entretien canadien désigné par le fournisseur. En cas de réparation ou de modification effectuées par l’utilisateur ou de mauvais fonctionnement de l’appareillage, le service de télécommunications peut demander le débranchment de l’appareillage.

Pour leur propre sécurité, les utilisateurs devraient s’assurer que les mises à la terre des lignes de distribution d’électricité, des lignes téléphoniques et de la tuyauterie métallique interne sont raccordées ensemble. Cette mesure de sécurité est particulièrement importante en milieu rural.

Attention: Les utilisateurs ne doivent pas procéder à ces raccordements eux-mêmes mais doivent plutôt faire appel aux pouvoirs de réglementation en cause ou à un électricien, selon le cas.

Canada Requirements Only *(continued)*

D. O. C. Explanatory Notes: Equipment Attachment Limitations

The Canadian Department of Communications label identifies certified equipment. This certification meets certain telecommunication network protective, operational and safety requirements. The department does not guarantee the equipment will operate to the users satisfaction.

Before installing the equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

Notes explicatives du ministère des Communications: limites visant les accessoires

L'étiquette du ministère des Communications du Canada indique que l'appareillage est certifié, c'est-à-dire qu'il respecte certaines exigences de sécurité et de fonctionnement visant les réseaux de télécommunications. Le ministère ne garantit pas que l'appareillage fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer l'appareillage, s'assurer qu'il peut être branché aux installations du service de télécommunications local. L'appareillage doit aussi être raccordé selon des méthodes acceptées. Dans certains cas, le câblage interne du service de télécommunications utilisé pour une ligne individuelle peut être allongé au moyen d'un connecteur certifié (prolongateur téléphonique). Le client doit toutefois prendre note qu'une telle installation n'assure pas un service parfait en tout temps.

Les réparations de l'appareillage certifié devraient être confiées à un service d'entretien canadien désigné par le fournisseur. En cas de réparation ou de modification effectuées par l'utilisateur ou de mauvais fonctionnement de l'appareillage, le service de télécommunications peut demander le débranchment de l'appareillage.

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Attention: Les utilisateurs ne doivent pas procéder à ces raccordements eux-mêmes mais doivent plutôt faire appel aux pouvoirs de réglementation en cause ou à un électricien, selon le cas.

Canada Requirements Only *(continued)*

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (Access Feeder Node, Access Link Node, Access Node, Access Stack Node, Backbone Concentrator Node, Backbone Concentrator Node Switch, Backbone Link Node, Backbone Link Node Switch, Concentrator Node, Feeder Node, Link Node) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Réglement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (Access Feeder Node, Access Link Node, Access Node, Access Stack Node, Backbone Concentrator Node, Backbone Concentrator Node Switch, Backbone Link Node, Backbone Link Node Switch, Concentrator Node, Feeder Node, Link Node) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Réglement sur le brouillage radioélectrique du ministère des Communications du Canada.

T1 Service Compliance Statements

T1 Service

NOTE: This T1 Service notice applies to you only if you have received a single or dual port Multi-Channel T1 (MCT1) Link Module (which provides an internal CSU).

This equipment complies with Part 68 of FCC Rules. Please note the following:

1. You are required to request T1 service from the telephone company before you connect the CSU to a T1 network. When you request T1 service, you must provide the telephone company with the following data:
   - The Facility Interface Code

     Provide the telephone company with both codes below:

     — 04DU9-B (1.544 MB D4 framing format)
     — 04DU9-C (1.544 MB ESF format)

     The telephone company will select the code it has available.
   - The Service Order Code: 6.0F
   - The required USOC jack: RJ48C
   - The make, model number, and FCC Registration number of the CSU.
2. Your telephone company may make changes to its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. The telephone company will notify you in advance of such changes to give you an opportunity to maintain uninterrupted telephone service.
3. If your CSU causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance, but if advance notice is not practical, you will be notified as soon as possible and will be informed of your right to file a complaint with the FCC.
4. If you experience trouble with the CSU, please contact Bay Networks Technical Response Center in your area for service or repairs. Repairs should be performed only by service personnel authorized by Bay Networks, Inc.

United States	1-800-2LAN-WAN
Valbonne, France	(33) 92-96-69-68
Sydney, Australia	(61) 2-9927-8880
Tokyo, Japan	(81) 3-5402-7041
5. You are required to notify the telephone company when you disconnect the CSU from the network and when you disconnect the BCNX or BLNX from the network.

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Preface

If you are responsible for configuring, managing, or upgrading Bay Networks® routers, read this document.

Conventions

bold text	Indicates text that you need to enter, command names, and buttons in menu paths. Example: Enter **wfsm &**
	Example: Use the **dinfo** command.
	Example: ATM DXI > Interfaces > **PVCs** identifies the PVCs button in the window that appears when you select the Interfaces option from the ATM DXI menu.
italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
`screen text`	Indicates data that appears on the screen. Example: `Set Bay Networks Trap Monitor Filters`

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Region	Telephone number	Fax number
United States and Canada	1-800-2LANWAN; then enter Express Routing Code (ERC) 290, when prompted, to purchase or renew a service contract 1-508-916-8880 (direct)	1-508-670-8766
Europe	33-4-92-96-69-66	33-4-92-96-69-96
Asia/Pacific	61-2-9927-8888	61-2-9927-8899
Latin America	561-988-7661	561-988-7550

How to Get Help

If you purchased a service contract for your Bay Networks product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller for assistance.

If you purchased a Bay Networks service program, call one of the following Bay Networks technical response centers:

Technical Response Center	Telephone number	Fax number
Billerica, MA	1-800-2LANWAN	508-670-8765
Santa Clara, CA	1-800-2LANWAN	408-495-1188
Valbonne, France	33-4-92-96-69-68	33-4-92-96-69-98
Sydney, Australia	61-2-9927-8800	61-2-9927-8811
Tokyo, Japan	81-3-5402-0180	81-3-5402-0173

For More Information

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Release Notes for Router Software Version 11.02

This document contains the latest information about Bay Networks® Router Software Version 11.02.

These release notes include information about

- Upgrading to Version 11.02
- New Features
- Guidelines for Using Version 11.02
- Protocols Supported
- Standards Supported
- Flash Memory Cards Supported

Upgrading to Version 11.02

To upgrade your router software to Version 11.02, or to upgrade your Site Manager software to Version 5.02, refer to *Upgrading Routers from Version 7-10.xx to Version 11.0* for instructions and also to the *Documentation Changes Notice for Router Version 11.02 and Site Manager Version 5.02* for supplemental information. Your upgrade package contains these documents.

New Features

Bay Networks has implemented the following new features in the router software for Version 11.02.

ATM Per-VC Clipping

This added ATM traffic shaping capability allows clipping on a per-VC basis. This capability clips only VCs that fall outside of a predetermined range while allowing other VCs to continue operating normally.

Bay Command Console (BCC)

With Version 11.02, you can now use the BCC™ to configure AN® and ANH® routers, in addition to configuring BLN® and BCN® routers.

Version 11.01 of the router software introduced the first phase of the BCC -- a new command line interface for Bay Networks devices.

Since this is a trial version of the BCC and we expect the interface to evolve and expand substantially, we are not documenting the current BCC commands in our protocol-specific documentation.

If you want to try the BCC interface, first read about the platform requirements and the list of protocols, interfaces, and link modules you can configure. For information about using the BCC, see “Guidelines for Using Version 11.02” later in these release notes.

Platform Requirements

With the BayRS 11.02 release, the BCC can run on AN and BN platforms configured with 8 MB of dynamic RAM (DRAM). The BCC also requires 1.5 MB of free memory space to start on a slot. If you attempt to start the BCC with insufficient DRAM or free memory on a slot, the BCC returns an error message. If you receive an error message from BCC, you can use Site Manager to create, modify, and view the AN or BN configurations.

Refer to the following list for specific platform and memory guidelines:

- On AN platforms, you cannot
  - -- Enable or disable DCM daughterboards or hub functionality.
  - -- Configure ISDN or DSU/CSU functionality.
- On BN platforms, you can run the BCC on the Fast Routing Engine (FRE® and FRE-2), but not on the Advanced Routing Engine (ARE).
- You can check memory usage by entering the **show memory** command before and after starting the BCC on a slot.

Configuring Protocols, Interfaces, and Link Modules

You can use BCC commands to configure the following protocols, interfaces, and link modules:

Global Protocols

- IP (including access policies)
- ARP
- IGMP
- OSPF (including accept and announce policies)
- BGP (including accept and announce policies)
- Telnet (server and client)
- TFTP
- FTP
- NTP
- SNMP

Interface Protocols

- IP
- ARP
- RIP
- OSPF
- Router Discovery (RDISC)
- Wellfleet Standard Point-to-Point
- PPP (multilink currently not supported)

Interfaces (see also the list of link modules supporting these interface types)

- Console
- Ethernet
- Token ring
- Synchronous
- FDDI
- HSSI
- Virtual

Link Modules

Module ID	wfName	Description
40	dst416	Model 5740 Dual Sync with Token Ring
80	sync	Model 5280 Quad Sync
118	sse	Model 5410 Single Sync with Ethernet
132	enet3	Model 5505 Dual Ethernet
162	qenf	Model 5450 Quad Ethernet without hardware filters
164	qef	Model 5950 Quad Ethernet with hardware filters
176	dtok	Model 5710 Dual Token Ring
192	wffddi2m	Model 5930 Multimode FDDI
193	wffddi1m	Model 5943 Hybrid FDDI with single mode on connector B

(continued)

Module ID	wfName	Description
194	wffddi2s	Model 5940 Single Mode FDDI
195	wffddi1s	Model 5942 Hybrid FDDI with single mode on connector A
196	wffddi2mf	Model 5946 Multi FDDI with hardware filters
197	wffddi1mf	Model 5949 Hybrid FDDI with hardware filters and single mode on connector B
198	wffddi2sf	Model 5947 Single Mode FDDI with hardware filters
199	wffddi1sf	Model 5948 Hybrid FDDI with hardware filters and single mode on connector A
225	shssi	Model 5295 HSSI
232	esafnf	Model 5431 Dual Sync Dual Ethernet without hardware filters
236	esaf	Model 5531 Dual Sync Dual Ethernet with 2-CAM filters and Model 5532 Dual Sync Dual Ethernet with 6-CAM filters
256	qtok	Model 50021 Quad Token Ring
4352	osync	Model 5008 Octal Sync
4353	comp	Octal Sync with 32-context compression daughterboard
4354	comp128	Model AG2104038 Octal Sync with 128-context compression daughterboard
4864	de100	Model 50038 100BASE-T Ethernet

After you use the BCC, we welcome your feedback. Please visit the BCC Web Site at the following URL, where you can leave us a message:

http://support.baynetworks.com/library/tpubs/bccfeedbk

Bisynchronous (Bisync) Over TCP on ARN Platforms

Bisync over TCP (BOT) is now supported on the Advanced Remote Node™ (ARN™) using the Tri-Serial, Ethernet/Tri-Serial, and the Token Ring/Tri-Serial Expansion Modules.

Dial Services

We have added the following new features to the dial services software. For information about how to use these features, refer to *Configuring Dial Services*.

AT Modem Command Set

Version 11.02 supports the Hayes AT Modem commands. These commands allow the use of a wide variety of internal and external modems. Support includes the commands required to configure and run asynchronous PPP across modem lines.

Frame Relay Dial-on-Demand

Version 11.02 supports Frame Relay dial-on-demand. With this support, you can use dial-on-demand to access a Frame Relay network on an “as needed” basis, eliminating the need for expensive leased lines.

BAP

Version 11.02 supports the Bandwidth Allocation Protocol (BAP) over ISDN. For PPP connections across ISDN lines, you can use BAP to dynamically allocate bandwidth for a multilink bundle. BAP works together with bandwidth-on-demand.

X.25 Over D Channel for BRI Service

Version 11.02 supports using the ISDN D channel to send X.25 packets across a network.

Data Link Switching (DLSw)

Version 11.02 adds the following DLSw features:

- Simplified Site Manager user interface to DLSw
- SNA PU Type 1 support
- DLSw Version 2
- DLSw backup peers

Simplified Site Manager User Interface

Version 11.02 simplifies the Site Manager user interface to DLSw. This simplified interface reduces the number of screens initially used to configure DLSw, allowing you to provide faster network definitions for LAN and Frame Relay interfaces, as well as

- Reduce the number of common configuration errors
- Simplify problem determination when troubleshooting a DLSw network
- Provide more consistency when configuring DLSw on different types of interfaces

When configuring a LAN interface for the first time, DLSw now requests two screens of information:

- DLSw Basic Global Configuration -- Enables you to specify all global parameters from all subsystems, as well as add a single Peer IP Table entry
- DLSw Basic Interface Configuration -- Enables you to specify all relevant interface-related parameters for subsystems

In addition, infrequently used parameters have been removed from the global screens, and several windows have been eliminated or clarified. Refer to *Configuring DLSw Services* for more information.

SNA PU Type 1 Support

Version 11.02 supports PU Type 1 SDLC-attached controllers (such as the IBM 5294 and 5394) in a DLSw network using a single SDLC line. This functionality can save the cost of upgrading to the newer IBM 5494 (PU Type 2.1) AS/400 controllers.

To configure an SDLC-attached PU 1 device, users must set the following parameters in Site Manager:

- PU Type -- Set to TYPE1
- XID Format -- Set to VARIABLE1

For more information about setting the PU Type and XID format, refer to *Configuring DLSw Services*.

DLSw Version 2 Support

Version 11.02 supports DLSw Version 2, extending the original implementation (RFC 1434) and the subsequent DLSw Version 1 (RFC 1795). Intended for large networks, the Version 2 subset increases network scalability and provides the following enhancements:

- Transmission of UDP explorer frames
- Single TCP/IP connection

You can manage peer types by configuring them as UDP, TCP, or Unknown peers.

A router that you configure for DLSw Version 2 can also communicate with routers running RFC 1434 and RFC 1795 implementations.

Version 11.02 does not support the DLSw Version 2 IP multicasting feature.

DLSw Backup Peers

DLSw backup peers enable users to define an alternate IP destination address when the primary peer becomes unavailable or is unreachable. This feature increases network availability for mission-critical IBM customers.

If a DLSw session with a remote (primary) peer fails, DLSw initiates a new connection with a specified backup peer. Configuring a backup peer provides

- Higher network availability -- A backup peers increases overall network uptime.
- Reduced cost for backup -- By defining backup peers to use dial lines, the backup circuit is used only when session traffic exists.
- Improved problem determination and resolution -- Traffic takes the primary path if available, and uses the secondary path only if the primary is not available.

Version 11.02/5.02 supports DLSw backup peers only for routers running RFC 1434 and RFC 1795 implementations. For more information about DLSw backup peers, refer to *Configuring DLSw Services*.

Equal Cost Multipath (ECMP)

Version 11.02/5.02 now supports ECMP enhancements to RIP and OSPF. ECMP provides the ability to simultaneously forward traffic, intended for the same location, over multiple network paths (up to five) and using the same routing cost.

RADIUS Client: Authentication and Accounting

Version 11.02/5.02 now provides Remote Authentication Dial-in User Service (RADIUS) authentication and accounting. RADIUS defines an open and scalable systems approach to security, billing, and usage control. By using a central authentication server, RADIUS simplifies the security process by authenticating users against a UNIX password file, Network Information Service (NIS), or RADIUS database. In addition to authenticating users, RADIUS provides accounting information (statistics) for each call the RADIUS client receives.

X.25 Address Insertion

Incoming X.25 calls that do not contain a called X.121 address are assigned to the first SVC mapping entry and use the destination X.121 address associated with that entry.

X.25 Over the ISDN D Channel

Version 11.02 supports X.25 over the ISDN D channel. This feature allows the router to transport X.25 packets without incurring the expense of a leased line. You can use the ISDN line for normal switched service applications as well as for X.25 traffic.

The Bay Networks implementation of X.25 over the ISDN D channel is based on ITU-T (formerly CCITT) recommendation X.31. Bay Networks has tested and supports X.25 over the ISDN D channel in the following countries:

- France
- Germany
- Spain
- Switzerland

For information about X.25 over the ISDN D channel, refer to the *Documentation Changes Notice for Router Version 11.02 and Site Manager Version 5.02*.

New Hardware Products

This section describes new hardware products that support Release 11.02/5.02.

Data Collection Modules for the ARN

Version 11.02/5.02 supports up to two optional Ethernet data collection modules (DCMs) for the ARN -- one for the Ethernet interface on the base module and one for the Ethernet interface on the expansion module.

Before installing a DCM, refer to "ARN DCM Dependencies" later in these release notes for supplemental information. Refer to the *Documentation Changes Notice for Router Version 11.02 and Site Manager Version 5.02* for boot and diagnostic PROM upgrade information, and to *Installing an Ethernet RMON DCM in a BayStack ARN Router* for installation instructions.

QMCT1 w/DS0A Link Module

The QMCT1 w/DS0A link module supports the DS0A subrate frame format standard, which enables the interface to support SDLC traffic at live speeds of 9.6 Kb/s and 19.2 Kb/s. This link module also supports DS0 to T1 speeds. Refer to *Configuring WAN Line Services* for information about how to configure the QMCT1 link module.

Guidelines for Using Version 11.02

Note the following guidelines when using Version 11.02.

ARN Guidelines

The following sections provide specific guidelines for using the ARN.

ARN Memory Requirements

The following features require a minimum DRAM configuration of 8 MB:

- DLSw
- ISDN BRI
- Token ring base or expansion module configurations

Using the Technician Interface ARN Installation Script

You can use the *inst_arn.bat* script from a Technician Interface prompt on the router to configure all except the following ARN interfaces:

- V.34 modem adapter module
- ISDN U adapter module
- ISDN S/T adapter module

Refer to *Installing and Operating BayStack ARN Routers* for information about using the ARN installation script Quick-Start procedure.

Cycling Power to the ARN

To ensure a complete power cycle, we recommend that you wait at least 4 seconds between turning off the ARN and turning it back on.

Caution: Cycling power to the ARN too quickly could cause an error.

Using the Technician Interface Packet Capture Script on an ARN

The Technician Interface Packet Capture script (*packet.bat*) now prompts for the module number of the interface on a BayStack ARN. Enter the appropriate module number from Table 1, except for synchronous interfaces, where the module number should always be 1.

Table 1. ARN Module Numbers for packet.bat

ARN Interface	Technician Interface Module Number
Base module (XCVR1 or TOKEN1)	1
First WAN adapter module interface (COM1 or ISDN1)	2
Second WAN adapter module interface (COM2 or ISDN2)	3
Expansion module interface (XCVR2, TOKEN2, or COM3-5)	4

Note: For all synchronous interfaces, enter module number 1. For serial interfaces that are configured for other WAN services (for example, BOT or ISDN interfaces), enter the actual module number (2 or 3).

Memory Allocation on ARN Routers

Although you can change the default memory allocation on other Bay Networks router platforms, this “buffer carving” feature is not currently supported on the ARN platform.

On the ARN, Site Manager does not support the Admin > Kernel Configuration option, and the Technician Interface does not support set commands for wfKernCfgParamEntry objects. Attempting to set wfKernCfgParamGlobMem on the ARN results in a warning message.

ARN DCM Dependencies

The following sections describe various dependencies associated with using the ARN DCM.

DCM Hardware Dependencies for the ARN Router

The DCM board that you install in the ARN router must be revision D or E or later, depending on the part number on DCM boards. The part numbers for supported DCM boards are

- 920-394-D
- 920-561-E
- 920-562-D

These part numbers correspond to DCM boards that use different types of flash (Intel or Atmel) modules. The part number of the DCM board that ships with the ARN router is 920-562-D.

To determine the hardware revision of a DCM board installed on an ARN router running software version 11.00 or later, perform the following steps from the Technician Interface:

1. **Enter the following command to get the instance ID of the DCM entry:**

   [1:TN]$ list -i wfDCMEntry

   The Technician Interface displays the instance ID.

   ```
   inst_ids  = 1
   ```

2. **Enter the following command, appending the instance ID to it:**

   [1:TN]$ get wfDCMEntry.wfDCMhwRev.1

   The Technician Interface displays the hardware revision of the DCM board.

   ```
   wfDCMEntry.wfDCMhwRev.1 = "C"
   ```

DCM Software Image and Router Software Compatibility

Router Software Version 11.02 ships with the Version 1.4.1 DCM software image. The Version 1.4.1 DCM software image is backwards-compatible with Router Software Versions 9.0*x* and 10.0*x*.

To run RMON on an ARN router, you must upgrade the DCM software image to Version 1.4.1 and the router software image to version 11.02.

If you have an AN or ANH router running router software version 11.00 or later, we also recommend that you upgrade to the Version 1.4.1 DCM software image.

Before you attempt to upgrade a router to Version 11.02, we recommend that you first check the DCM software version residing on the Ethernet DCM.

Determining the DCM Software Image Version

Enter the following command from the Technician Interface to determine the DCM software image version:

[1:1]$ get wfDCMmw.wfDCMAgentImageVersion.0

The Technician Interface generates a message similar to the following:

```
wfDCMmw.wfDCMAgentImageVersion.0 = "V1.4.1"
```

Upgrading the DCM Software Image

Refer to the *Documentation Changes Notice for Router Version 11.02 and Site Manager Version 5.02* for instructions on loading the latest version of the DCM software image.

Changing RMON DCM Configurations

You must disable and then reenable the DCM software on an AN, ANH, or ARN router after setting related MIB variables.

Configuring Ethernet with DCM Interfaces on an ARN

To ensure proper DCM operation, you must configure any Ethernet w/DCM interfaces as the first, second, or third circuit on the ARN. We recommend that you configure the Ethernet w/DCM interfaces before you configure any other interfaces on the device.

Recommendations for ATM Signaling Parameters

When using an ATM link module with an 8-MB ATM Routing Engine (ARE), we recommend that you modify the parameters in Table 2 to best use memory allocation.

Table 2. Settings for ATM Signaling Parameters

Parameter	Recommended Setting
Max Number of SVC Applications	20
Max Point to Multipoint Connections	40

Network Booting on DSU/CSU Interfaces

AN and ANH DSU/CSU interfaces do not support network booting in Version 11.02. The ARN DSU/CSU supports network booting only over interfaces configured for 56-Kb/s DDS service.

Using the BCC

Before entering the BCC initialization command (**bcc-trial**) at the Technician Interface prompt of a BN, AN, or ANH router, back up your existing configuration files to another location.

Caution: BCC configuration and **source** commands make immediate changes to the active device configuration. Read about the **source** command in *Using the Bay Command Console*.

After starting the BCC, enter **help** at the bcc> prompt for initial instructions. You can obtain online help for different types of information (lists of configurable objects, attributes, and attribute values; current attribute values; configuration data; and so on). For details on how to use the BCC interface, refer to *Using the Bay Command Console*. Refer also to the *Documentation Changes Notice for Router Version 11.02 and Site Manager Version 5.02*.

Configuring NTP Using the Technician Interface

When you use the Technician Interface to configure the Network Time Protocol (NTP), you must configure NTP on each slot on the router to ensure that NTP initializes correctly.

You can configure NTP on each slot by setting the following MIB variable from the Technician Interface:

set *wfProtocols.wfNTPLoad.0 0xffffffff*

commit

Support for Banyan 80C4 ISAP

Bay Networks routers now support the Banyan 80C4 ISAP on Ethernet.

Setting Modem Initialization Strings Using the Technician Interface

Several AT modem commands contain a dollar sign ($) or backslash (\). The Technician Interface uses the $ to reference a variable and the \ to prevent the substitution of a variable. If one of these symbols appears in the wfModemEntry.wfModemCfgInitString initialization command, the Technician Interface does not set the string. For example:

```
[1:1]$ get wfModemEntry.wfModemCfgInitString.1.2

wfModemEntry.wfModemCfgInitString.1.2 = "ATF"

[1:1]$ set wfModemEntry.wfModemCfgInitString.1.2 "AT$SB64000";commit

Variable: Undefined Variable - SB64000
```

The Technician Interface interprets the command as containing an undefined variable and does not change the MIB value.

To set the MIB variable, you must add a backslash (\) in front of the symbol causing the confusion (that is, the $ or \). For example:

```
[1:1]$ get wfModemEntry.wfModemCfgInitString.1.2

wfModemEntry.wfModemCfgInitString.1.2 = "ATF"

[1:1]$ set wfModemEntry.wfModemCfgInitString.1.2 "AT\$SB64000";commit
```

Changing the PPP MRU Setting for Routers Running Software Versions 11.02 and Earlier

For Version 11.02, we changed the PPP default MRU value for switched services from 1590 bytes to 1500 bytes. If you have a network with both 11.02 and pre-11.02 Bay Networks routers, or Bay Corporate LAN Access Module (CLAM™) routers configured with dial-on-demand, standby, dial backup, or bandwidth-on-demand circuits, make sure that the value you set for the PPP MRU parameter is the same for the central-site router and the remote-site routers.

Refer to the *Documentation Changes Notice for Router Version 11.02 and Site Manager Version 5.02* for details.

ISP Mode Support

Version 11.02 does not fully support ISP mode. Do not set the ISP Mode parameter to anything other than the default. Do not enable this parameter without direction from Bay Networks Customer Service. Bay Networks will support this feature only for customers directed to enable it by Customer Service.

Protocols Supported

Router Software Version 11.02 supports the following bridging/routing protocols and router configuration features:

- AppleTalk and AppleTalk Update-based Routing Protocol (AURP)
- Advanced Peer-to-Peer Networking (APPN)
- Asynchronous transfer mode (ATM)
- ATM Data Exchange Interface (ATMDXI)
- ATM LAN Emulation (802.3 and 802.5)
- Bandwidth Allocation Protocol (BAP)
- Binary Synchronous Communication Type 3 (BSC3)
- Bootstrap Protocol (BOOTP)
- Border Gateway Protocol (BGP-3 and BGP-4)
- Bisync over TCP (BOT)

- Classless interdomain routing (CIDR)
- Data compression
- Data link switching (DLSw)
- DECnet Phase IV Routing Protocol
- Distance Vector Multicast Routing Protocol (DVMRP)
- Dynamic Host Configuration Protocol (DHCP)
- Exterior Gateway Protocol-2 (EGP-2)
- Frame Relay
- File Transfer Protocol (FTP)
- HP Probe Protocol
- Integrated Services Digital Network (ISDN)
- Interface redundancy
- Internet Gateway Management Protocol (IGMP)
- Internet Protocol (IP)
- Internet Control Message Protocol (ICMP)
- Internet Packet Exchange (IPX) Protocol
- Internet Stream Protocol (ST2)
- Learning Bridge Protocol
- Logical Link Control 2 (LLC2) Protocol
- Native Mode LAN (NML) Protocol
- Network Core Protocol
- Network Time Protocol (NTP)
- Open Shortest Path First (OSPF) Protocol
- Open Systems Interconnection (OSI) Routing Protocol
- Point-to-Point Protocol (PPP)
- Protocol prioritization
- Qualified Logical Link Control (QLLC)
- Remote Authentication Dial-In User Service (RADIUS)

- RaiseDTR dialup
- Routing Information Protocol (RIP)
- Router discovery
- Router redundancy
- Service Advertisement Protocol (SAP)
- Simple Network Management Protocol (SNMP)
- Source Routing Bridge Protocol
- Spanning Tree Protocol
- Switched multimegabit data service (SMDS)
- Synchronous Data Link Control (SDLC)
- Telnet Protocol (Inbound and Outbound)
- Transmission Control Protocol (TCP)
- Transparent Bridge
- Transparent-to-Source Routing Translation Bridge
- Trivial File Transfer Protocol (TFTP)
- V.25BIS dialup
- Virtual Networking System (VINES)
- X.25 Protocol
- XMODEM and YMODEM Protocols
- Xerox Network Systems (XNS) Protocol

Standards Supported

Table 3 lists the request for comments (RFCs) and other standards documents with which Version 11.02 complies. Version 11.02 may support additional standards that are not listed in this table.

Table 3. Standards Supported by Version 11.02

Standard	Description
ANSI T1.107b-1991	Digital Hierarchy - Supplement to formats specifications
ANSI T1.404	DS3 Metallic Interface Specification
ANSI X3t9.5	Fiber Distributed Data Interface (FDDI)
Bellcore FR-440	Transport Systems Generic Requirements (TSGR)
Bellcore TR-TSY-000009	Asynchronous Digital Multiplexes, Requirements and Objectives
Bellcore TR-TSY-000010	Synchronous DS3 Add-Drop Multiplex (ADM 3/X) Requirements and Objectives
IEEE 802.1	Logical Link Control (LLC)
IEEE 802.3	Carrier Sense Multiple Access with Collision Detection (CSMA/CD)
IEEE 802.5	Token Ring Access Method and Physical Layer Specifications
IEEE 802.10	Bridge with Spanning Tree
ITU Q.921	ISDN Layer 2 Specification
ITU Q.921	ISDN Layer 3 Specification
ITU X.25	Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuits
RFC 768	User Datagram Protocol (UDP)
RFC 791	Internet Protocol (IP)
RFC 792	Internet Control Message Protocol (ICMP)

(continued)

Table 3. Standards Supported by Version 11.02 *(continued)*

Standard	Description
RFC 793	Transmission Control Protocol (TCP)
RFC 813	Window and Acknowledgment Strategy in TCP
RFC 826	Ethernet Address Resolution Protocol
RFC 827	Exterior Gateway Protocol (EGP)
RFC 854	Telnet Protocol Specification
RFC 855	Telnet Option Specification
RFC 856	Telnet Binary Transmission
RFC 857	Telnet Echo Option
RFC 858	Telnet Suppress Go Ahead Option
RFC 859	Telnet Status Option
RFC 860	Telnet Timing Mark Option
RFC 861	Telnet Extended Options: List Option
RFC 863	Discard Protocol
RFC 877	Transmission of IP Datagrams over Public Data Networks
RFC 879	TCP Maximum Segment Size and Related Topics
RFC 888	"STUB" Exterior Gateway Protocol
RFC 894	Transmission of IP Datagrams over Ethernet Networks
RFC 896	Congestion Control in IP/TCP Internetworks
RFC 903	Reverse Address Resolution Protocol
RFC 904	Exterior Gateway Protocol Formal Specification
RFC 919	Broadcasting Internet Datagrams
RFC 922	Broadcasting Internet Datagrams in Subnets
RFC 925	Multi-LAN Address Resolution
RFC 950	Internet Standard Subnetting Procedure

(continued)

Table 3. Standards Supported by Version 11.02 *(continued)*

Standard	Description
RFC 951	Bootstrap Protocol
RFC 959	File Transfer Protocol
RFC 994	Protocol for Providing the Connectionless-mode Network Service
RFC 1009	Requirements for Internet Gateways
RFC 1027	Using ARP to Implement Transparent Subnet Gateways
RFC 1042	Transmission of IP over IEEE/802 Networks
RFC 1058	Routing Information Protocol
RFC 1075	Distance Vector Multicast Routing Protocol (DVMRP)
RFC 1076	Redefinition of Managed Objects for IEEE 802.3 Repeater Devices (AN Hubs only)
RFC 1079	Telnet Terminal Speed Option
RFC 1084	BOOTP Vendor Information Extensions
RFC 1091	Telnet Terminal-Type Option
RFC 1108	Security Options for the Internet Protocol
RFC 1112	Host Extensions for IP Multicasting Appendix I. Internet Group Management Protocol
RFC 1116	Telnet Line-mode Option
RFC 1139	Echo Function for ISO 8473
RFC 1155	Structure and Identification of Management Information for TCP/IP-based Internets
RFC 1157	Simple Network Management Protocol (SNMP)
RFC 1163	BGP-2 (obsoleted by RFC 1267)
RFC 1164	Application of BGP in the Internet
RFC 1166	Internet Numbers
RFC 1188	Proposed Standard for the Transmission of IP over FDDI
RFC 1191	Path MTU Discovery

(continued)

Table 3. Standards Supported by Version 11.02 *(continued)*

Standard	Description
RFC 1209	Transmission of IP Datagrams over SMDS
RFC 1212	Concise MIB Definitions
RFC 1213	MIB for Network Management of TCP/IP-based Internets
RFC 1267	Border Gateway Protocol 3 (BGP-3; obsoletes RFC 1163)
RFC 1293	Inverse ARP for Frame Relay
RFC 1294	Multiprotocol Interconnect over Frame Relay (obsoleted by RFC 1490)
RFC 1304	Definition of Managed Objects for the SIP Interface Type
RFC 1305	Network Time Protocol
RFC 1315	Management Information Base for Frame Relay DTEs
RFC 1323	TCP Extensions for High Performance
RFC 1331	Point-to-Point Protocol (PPP; obsoleted by RFC 1661)
RFC 1332	PPP Internet Protocol Control Protocol (IPCP)
RFC 1333	PPP Link Quality Monitoring (obsoleted by RFC 1989)
RFC 1334	PPP Authentication Protocols
RFC 1350	The TFTP Protocol (Revision 2)
RFC 1356	Multiprotocol Interconnect on X.25 and ISDN in the Packet Mode
RFC 1376	PPP DECnet Phase IV Control Protocol (DNCP)
RFC 1378	PPP AppleTalk Control Protocol (ATCP)
RFC 1390	Transmission of IP and ARP over FDDI Networks
RFC 1377	OSI over PPP
RFC 1403	BGP OSPF Interaction
RFC 1434	Data Link Switching: Switch-to-Switch Protocol
RFC 1483	Multiprotocol Encapsulation over ATM AAL5
RFC 1490	Multiprotocol Interconnect over Frame Relay (obsoletes RFC 1294)

(continued)

Table 3. Standards Supported by Version 11.02 *(continued)*

Standard	Description
RFC 1552	The PPP Internetwork Packet Exchange Control Protocol (IPXCP)
RFC 1577	Classical IP and ARP over ATM
RFC 1583	OSPF Version 2
RFC 1634	Novell IPX over Various WAN Media (IPXWAN)
RFC 1638	PPP Bridging Control Protocol (BCP)
RFC 1654	Border Gateway Protocol 4 (BGP-4; obsoleted by RFC 1771)
RFC 1661	Point-to-Point Protocol (PPP; obsoletes RFC 1331)
RFC 1662	PPP in HDLC-like Framing
RFC 1717	PPP Multilink Protocol (MP; obsoleted by RFC 1990)
RFC 1755	Signaling Support for IP over ATM
RFC 1757	Remote Network Monitoring Management Information Base (RMON), for AN, ANH, and ARN equipped with Data Collection Module only
RFC 1762	PPP Banyan VINES Control Protocol (BVCP)
RFC 1763	PPP DECnet Phase IV Control Protocol (DNCP)
RFC 1764	PPP XNS IDP Control Protocol (XNSCP)
RFC 1771	Border Gateway Protocol 4 (BGP-4; obsoletes RFC 1654)
RFC 1795	Data Link Switching: Switch-to-Switch Protocol, Version 1
RFC 1819	Internet Stream Protocol, Version 2
RFC 1989	PPP Link Quality Monitoring (obsoletes RFC 1333)
RFC 1990	PPP Multilink Protocol (MP; obsoletes RFC 1717)
RFC 2138	Remote Authentication Dial In User Service (RADIUS)
RFC 2139	RADIUS Accounting
VINES 4.11	The Bay Networks router software works with the Banyan VINES 4.11 standard. Bay Networks Router Software Version 8.10 and later also supports VINES 5.50 sequenced routing.

Flash Memory Cards Supported

Table 4 lists the 2-, 4-, 8-, and 16-MB Personal Computer Memory Card International Association (PCMCIA) standard flash memory cards that are qualified for use in Bay Networks routers.

Table 4. Approved Flash Memory Cards

Size	Vendor	Part Number
2 MB	AMD	AMC002AFLKA
	Amp	1-797078-3
	Fujitsu	MB98A811220
	Intel	1MC002FLKA
	Maxell	EF21B(AA) WEL.M-20
	Mitsubishi	MF82ML-G1FAT01
	Panasonic	BN-02MHFR
	Texas Instruments	CMS68F2MB-250
4 MB	AMD	AMC004CFLKA-150
	Centennial	FL04M-20-1119
	Centennial	FL04M-20-11138
	IBM	IBM1700400D1DA-25
	Intel	IMC004FLSAQ1381
8 MB	AMD	AMC008CFLKA
	Centennial	FLO8M-25-11119-01
	Intel	IMC008FLSP/Q1422
16 MB	Centennial	FL16M-20-1119-03
	Epson	HWB161BNX2